North Carolina
Lab-Oratory
N.C. Department of Health and Human Services / State Laboratory of Public Health

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From the Director's Chair

New Laboratory Facility Status

Leslie A. Wolf, PhD, HCLD (ABB)
Laboratory Director

Funding was approved for a new Public Health and Chief Medical Examiner laboratory in the 2006 short session of the General Assembly. During July, August and September 2006, proposals from design teams with experience in building highly specialized laboratory facilities were requested, received and reviewed by a steering committee that included Dr. Lou Turner, Epidemiology Deputy Section Chief. By October 2006, the local firm O'Brien-Atkins was selected as the facility designer. This firm has partnered with a laboratory consultant firm (CUH2A) that has been intimately involved with design of other new, state-of-the-art public health laboratory facilities in Virginia, Minnesota and Arizona. CUH2A is also the firm that provided SLPH with a new laboratory feasibility study approximately two years ago. This study was critical in laying the foundation for determining new space requirements and key features of a modern laboratory, ultimately allowing for cost estimation for a new facility. Over the next few months, the design team will be meeting with laboratory managers and supervisors to finalize requirements. It is expected that the design process will last approximately nine to twelve months, and groundbreaking could occur in mid- to late 2007. The new laboratory will be located on District Drive in Raleigh, N.C., not far from the N.C. State University College of Veterinary Medicine and the N.C. Museum of Art.

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MISSION statement

The State Laboratory of Public Health provides certain medical and environmental laboratory services (testing, consultation and training) to public and private health provider organizations responsible for the promotion, protection and assurance of the health of North Carolina citizens.

Director's Chair cont. from page 1

State Health Department Accreditation Project

As most of you are well aware, local health departments have been experiencing the process of accreditation for over two years. It seems only fair that the state health department would follow suit. Although there are no national standards for the accreditation of state health department systems, Dr. Leah Devlin, Division of Public Health Director, decided that North Carolina would participate in a pilot program to evaluate how well the following 12 essential public health services are delivered at the state level:

- Monitor health status to identify problems;
- Diagnose and investigate health problems and health hazards;
- Inform, educate and empower people about health issues;
- Mobilize partnerships to identify and solve health problems;
- Develop policies and plans that support individual and statewide health efforts;
- Enforce laws and regulations that protect health and ensure safety;
- Link people to needed personal health services and assure provision of health care when otherwise unavailable;
- Assure competent public and personal health care workforce;
- Evaluate effectiveness, accessibility, and quality of personal and population-based health services;
- Research for new insights and innovative solutions to health problems;
- Assure safe agency facilities and accessible administrative services; and
- Assure that the Commission for Health Services, N.C. General Assembly, Secretary of DHHS, State Health Director, and General Statutes protect and promote the public's health.

The standards emphasize planning, review, coordination, and cooperation across programs at the state level. In addition, emphasis is placed on providing training and technical assistance to our local partners and enforcing regulations where applicable. Each division section and branch was given an opportunity to provide feedback as the standards were developed by Denise Pavletic and her team in the Office of Performance Improvement and Accountability. During the months of September, October and November 2006, documents were collected by each section and branch as evidence that certain standards are met. In December 2006, the evaluation team will review the submitted documents in preparation for site visits in January 2007. We view this accreditation project as a learning opportunity to improve the way essential public health services are delivered in North Carolina.

Dr. Leslie Wolf, Laboratory Director

Biotinidase Deficiency Testing Added to Newborn Screening Panel of Disorders

The Newborn Screening Program at the State Laboratory of Public Health is continually upgrading its panel of testing so that the newborns of our state are assured of the most comprehensive panel of tests. To achieve this goal, in November 2004 screening for Biotinidase Deficiency was added to the existing panel, which already included testing for Congenital Adrenal Hyperplasia, Primary Hypothyroidism, Galactosemia (galactose-1-phosphate uridyl transferase deficiency), Hemoglobinopathies and Amino Acid, Organic Acid, and Fatty Acid Disorders.

Biotinidase Deficiency is an autosomal recessive disorder, meaning that the infant has inherited one copy of the gene for the deficiency from each parent. When both parents are carriers, the infant has a 25% chance of having the disorder, a 50% chance of being a carrier, and a 25 % chance of being unaffected. Lifestyles or environmental factors do not cause this disorder.

Biotin, a B vitamin, is obtained through dietary sources. Useable biotin is normally separated from bound biotin by the enzyme biotinidase, after which it can be used for the metabolism of fats, carbohydrates, and proteins. Therefore, biotinidase allows the body to recycle the biotin many times so that the body does not need to take in sizeable amounts in the diet. Infants with Biotinidase Deficiency typically have enzyme activity of 10% or less.

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Biotinidase Deficiency Testing cont. from page 2

An infant with Biotinidase Deficiency may not present with symptoms immediately after birth. Initial symptoms may include seizures and poor muscle tone. In addition, breathing irregularities, skin rashes, and loss of hair may also be seen. However, these are not exclusive to this deficiency. Without treatment, infants will suffer from neurological abnormalities and developmental delay. Nevertheless, outcomes for infants with detected Biotinidase Deficiency are positive. When diagnosed, infants with the disorder are placed on a regimen of daily oral free (or unbound) biotin therapy, which continues throughout life. With treatment, many of the symptoms will diminish or disappear altogether.

In establishing a screening program in North Carolina, a semi-quantitative methodology from Astoria-Pacific International was selected. This method utilizes the dried blood spot on filter paper specimen in a colorimetric assay. The assay automates the colorimetric method developed by Dr. Barry Wolf at the University of Virginia. In using this methodology, the laboratory uses instrumentation similar to that for galactosemia screening and avoids possible imprecisions inherent in a manual, visual method. Screening results are reported in Enzyme Response Units (ERU), with the following protocol:

NORMAL Classification:
ERU value of ≥ 10.0

BORDERLIINE Classification:
ERU between 5.1 and 9.9

ABNORMAL Classification:
ERU of ≤ 5.0

For screening results in the abnormal classification, the newborn screening follow-up coordinator immediately contacts the infant's healthcare provider. The physician determines the health status of the infant and contacts the nearest genetics center or metabolic clinic for recommendations from a metabolic geneticist. A serum sample from the infant is sent to a regional or national laboratory for biotinidase enzyme testing, and a repeat heel stick specimen is requested for the Newborn Screening Unit at the State Laboratory. For a borderline classification, a report is sent to the specimen submitter and the healthcare provider, requesting a repeat heel stick specimen. Should two specimens from an infant report as borderline, the same scenario as an abnormal classification will develop.

Since the advent of screening in 2004, one infant in North Carolina has been diagnosed with Biotinidase Deficiency. This full-term infant was asymptomatic at the time of screening, and the screening ERU value was 2.7. A second infant, with partial deficiency, was also full-term and asymptomatic, with an initial screening value of 4.1 ERU. Both infants are currently on treatment.

Screening for Biotinidase Deficiency is a valuable tool in the prevention of health and developmental problems in newborns in North Carolina. As for all newborn screening disorders, prompt and proper collection of the specimen is an important factor in timely diagnosis and treatment. If a repeat heel stick or serum follow-up testing is requested, it should be collected as soon as possible and submitted to the specialty laboratory or the State Laboratory of Public Health. Your participation in the newborn screening process ensures healthy and positive outcomes for the newborns in our state. If you have questions concerning Biotinidase Deficiency screening or any other newborn screening test, please call the Newborn Screening/Clinical Chemistry Unit at (919)733-3937. Information is also available at the State Laboratory website *(http://slph.state.nc.us)*.

REFERENCES:

1. Kit Insert, "Biotinidase Test System, Colorimetric Process, Semi-Quantitative," procedure 315-A995, Astoria-Pacific International, Rev. A 10/01

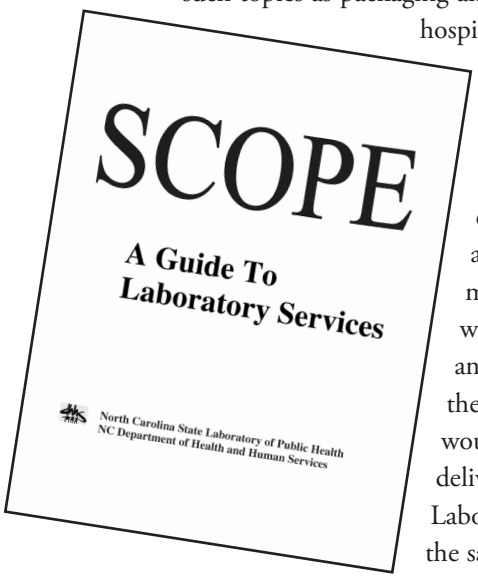
2. Standard Operating Procedure, Semi-Quantitative Method for Biotinidase Deficiency in Dried Blood Spots," FIA/GAL/BIO Laboratory, Rev. 9-6-06

3. "Protocol for Follow-Up Coordination, Biotinidase Deficiency," Lara Percenti, Division of Public Health, Women's & Children's Health Section

Ann W. Grush
General Supervisor
FIA/GAL/BIO Laboratory

Sentinel Laboratory Bioterrorism Communication Drill from the N.C. State Laboratory Of Public Health

The North Carolina State Laboratory of Public Health (NCSLPH) is a recipient of the CDC Cooperative Agreement Public Health Emergency Preparedness Grant. Therefore, NCSLPH is responsible to the CDC and to the citizens of North Carolina for preparing our laboratories, both public and private, to be able to respond to acts of bioterrorism or infectious disease outbreaks. As part of the state's preparedness efforts, NCSLPH has conducted statewide laboratory-specific training, such as bioterrorism workshops that include information about the Laboratory Response Network and laboratory protocols for ruling out potential bioterrorism agents. The NCSLPH has also conducted packaging and shipping workshops for our laboratory partners.



Since the NCSLPH is responsible for the proper expenditure of these CDC funds, the CDC requires it to assess the effectiveness of its Sentinel Laboratory Training Program. One way to do that is to perform a drill. With the assistance of participating sentinel laboratory directors, the Bioterrorism and Emerging Pathogens Unit (BTEP) developed a simple drill to measure the N.C. Sentinel Laboratory partners' ability to communicate after hours with state authorities to accomplish critical rule-out or confirmation testing.

The drill took place on August 24, 2006. A notice was faxed to three participating laboratories that were represented as Hospital Laboratories A, B, and C. The fax was followed up by a phone call by BTEP to the hospital laboratory. All drills were received within five minutes of being faxed to the laboratory. Each laboratory that called BTEP in response to the drill was asked a series of eight questions. These questions included such topics as packaging and shipping, storing of a positive sample at the hospital, and who should be contacted in response to the drill.

The value of a Sentinel Laboratory Communication Drill became very clear after this exercise. Laboratories A and B responded in a timely manner and were able to answer all or most questions asked of them. In regard to the wording of the shipping questions and the answers given, it was not clear who would get the sample to the NCSLPH for testing or who would be responsible for packaging a sample for delivery to the NCSLPH for testing. Sentinel Laboratory A stated that the courier would bring the sample to the NCSLPH. However, it is important to make sure the courier does run after hours and that the sample gets to the NCSLPH in a timely manner. Secondly, it is important to make sure that a trained, designated shipper is available at all times to package and ship samples for testing. The NCSLPH would advise on the proper packaging and shipping of samples being sent to the State Lab. Sentinel Laboratories B and C were unaware as to how far to carry the drill. Clearly communicating that this exercise should be carried out only one staff member deep (past the laboratorian) would have alleviated confusion. The expectations of this drill were that communication between LRN Sentinel Laboratories and Reference Laboratory occurs smoothly after hours, but this did not happen with Laboratory C. That lab's current protocol has direct, inter-laboratory contact being made only after an organism is isolated and preliminarily analyzed (in this case motility and hemolysis). The NCSLPH, in reviewing its workshop recommendations, will be changing its lectures to better communicatethe NCSLPH capabilities, especially with regard to primary clinical specimens. An updated protocol of specimen submissions will be shared with Laboratory C. Their protocol will be updated to direct the laboratory to contact NCSLPH if a clinician suspects a high-impact pathogen and preliminary laboratory analysis (when available) is consistent with clinical presentation. BTEP sample submission guidelines can also be found in the "SCOPE" on the NCSLPH website: *http://slph.state.nc.us/SCOPE_Final06.pdf*.

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Sentinel Laboratory Bioterrorism Communication Drill cont. from page 4

The drill was well received by all three participating laboratories, and the NCSLPH plans to perform a drill similar to this one on an annual basis. The drill goal will remain the same, but the execution of the drill will change as we become more proficient and gain experience conducting these types of exercises. In the future, the drill may be unannounced and even include such things as packaging and shipping a mock sample. It is very important that each facility have a trained designated shipper. The NCSLPH offers Packaging and Shipping workshops throughout the year, and the BTEP unit also offers a one day Bioterrorism Workshop. This workshop is geared towards the clinical laboratory and offers many lectures surrounding the BTEP unit. If you would like any additional information on workshops offered, please contact us.

BTEP 24/7 Contact Number:
919-807-8600

BTEP 24/7 Pager Number:
919-310-4243

BTEP Main Line:
919-807-8765

Important note: Please contact us prior to sending any samples to the NCSLPH for Bioterrorism Agents of Concern.

NCSLPH Welcomes New Emerging Infectious Diseases Fellows

In September, the North Carolina State Laboratory of Public Health (NCSLPH) welcomed two new Emerging Infectious Diseases Laboratory Fellows, Mindi Russell and Rachel Gast. Both are participating in one-year fellowships co-sponsored by the National Center for Infectious Diseases, Centers for Disease Control and Prevention, and the Association of Public Health Laboratories. Each year, fellows are selected from a pool of applicants after surviving a rigorous evaluation process. Those selected are then matched with local, state or federal (CDC) public health laboratories based upon common interests. Fellows obtain infectious disease laboratory training and conduct applied research within their host laboratory while receiving financial support through the fellowship program. Host laboratories can benefit from the implementation and validation of new methods, not to mention the extra pair of hands fellows can provide.

The NCSLPH has proudly served as a host laboratory since the program inception in 1995. In fact, our Laboratory Director, Dr. Leslie Wolf, completed the fellowship program here at the NCSLPH after finishing her PhD. Her efforts refined our current test panel for tickborne diseases in North Carolina. Other fellow contributions have included a comparison study of three different methods for the identification of atypical bacteria: conventional bacteriology, 16S ribosomal sequencing, and Biolog instrumentation; and the implementation of a molecular (Polymerase Chain Reaction) assay for Bordetella pertussis identification.

For the next year, Mindi Russell, under the guidance of Julie Ann Kase, will focus on the development and application of accurate and rapid methods to detect and genetically characterize Taenia solium in human stool specimens. Taenia solium is associated with the serious neurological condition, neurocysticercosis. Current parasitological methods at the NCSLPH cannot distinguish between the different Taenia species. Russell's project provides a means to increase the capabilities of the NCSLPH while gaining a better epidemiological understanding of the disease burden in North Carolina. Russell received her Master of Science in Food Microbiology from Kansas State University in October and is working on a Masters of Public Health degree.

Mindi Russell and Rachel Gast, Class 12, EID fellows

Rachel Gast completed undergraduate studies at Purdue University and a Master of Science degree in molecular genetics from the University of Iowa. She

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New Emerging Infectious Disease Fellows cont. from page 4

will be researching a universal DNA-based method for the detection of medically important fungal pathogens, including Cryptococcus, under the direction of Shermalyn Greene. Her year-long project will also include training in classic mycology at the NCSLPH.

Article submitted by:
Julie Ann Kase PhD,
Public Health Scientist, Bioterrorism and Emerging Pathogens Unit NCSLPH

Alternative Application of the Incident Command System

Over the past year, many governmental agencies have required their employees to attend courses on the Incident Command System (ICS.) According to the FEMA website:

> "ICS is a management system designed to enable effective and efficient domestic incident management by integrating a combination of facilities, equipment, personnel, procedures, and communications designed to enable effective and efficient domestic incident management.[1]"

The 14 essential features of any ICS include the following:

1. Common Terminology
2. Modular Organization
3. Management by Objectives
4. Reliance on an Incident Action Plan
5. Chain of Command and Unity of Command
6. Unified Command
7. Manageable Span of Control
8. Predesignated Incident Locations and Facilities
9. Resource Management
10. Information and Intelligence Management
11. Integrated Communications
12. Transfer of Command
13. Accountability
14. Deployment[1]

Although the Laboratory Improvement staff of the N.C. State Laboratory of Public Health are not Emergency Responders, they found a practical application to their ICS training. On August 4, 2006, after many months of planning and preparation, they presented the 2nd Annual Clinical Laboratory Day; *The Diabetes Challenge: Diagnosis, Education and Management*. This was a large-scale conference attended by 111 participants, 20 commercial vendors, and staff from both the State Lab and the Diabetes Prevention and Control Branch. Planning for the conference began by developing an effective management strategy.

The design was based on the top-down modular organizational structure of ICS. The Lab Improvement Staff modified the original ICS design and created a model that would facilitate the execution of the project. The framework of the design was divided into the following categories and subcategories with specific responsibilities:

Director: Liaison for the NCSLPH with the conference cosponsor, N.C. Diabetes Prevention and Control Branch; assigned each staff member to a category and designated appropriate duties; administered overall organization functions for the event.

Financial: Conference budget and "Memorandums of Understanding" with partnering agencies

Public Information: Advertising and registration

Operations: Vendors and speakers; vendor subcategories were door prizes and giveaways; speaker subcategories were travel and lodging.

Logistics: Facility and food; facility subcategories were classroom, communication, AV equipment, computer support, vendor needs, and break area; food subcategories were breaks, lunch, and beverages.

Everyone was ultimately accountable for their assignments and reported back to the Director. The planning phase as well as the conference went very smoothly and there was no duplication of efforts. Staff were able to easily see and therefore fulfill their assigned responsibilities.

As demonstrated here, ICS can be used for more than just a disaster situation. The flexibility that the system offers can be used in alternative settings to improve work flow, increase accountability, improve communication, and encourage cooperation in a situation where teamwork is a must.

1) ICS Review Document. FEMA ICS Resources Website. 2006. Available at: http://www.training.fema.gov/EMIWeb/IS/ICSResource/assets/reviewMaterials.pdf. Accessed October 10, 2006.

Submitted by
Jennifer Anderson, BS, MT(ASCP)CM
Laboratory Improvement Consultant

Ergonomics and the Microscope

Have you ever had to set a microscope on a book to achieve a comfortable viewing position? If your laboratory is equipped with older microscopes, you probably answered "yes." Microscopes can literally be a pain in the neck! Overextending the neck when using a microscope can produce significant muscle contractions, muscle fatigue and pain. Nerve injury may also occur from repetitive motions of the hands and the contact stress of arms resting on a hard surface. Long-term sessions of bending over a conventional microscope can strain both the visual and musculoskeletal systems. Fortunately, with the introduction of ergonomic features, many microscope manufacturers offer instruments that are safer and more comfortable to use for extended periods of time.

The word ergonomics is derived from two Greek words, "ergon" meaning work and "nomoi" meaning natural laws. Ergono-mics is about improving the well-being and overall performance of people by optimizing their compatibility with the objects they use. Applying ergonomics in the workplace should reduce stress from routine and repetitive tasks by making them more comfortable to perform. Microscope users are encouraged to use good posture, that is, a neutral body position, when working at the microscope. The following guidelines will help you achieve and maintain an optimal working position while using the microscope:

- Eyes – The eyepieces should angle no more than 30º above the horizontal plane of the desktop and should be in line with, or even extended over, the edge of the bench. The interocular distance of the eyepieces should be adjusted to assure that both eyes are focusing comfortably while looking downward. Each eyepiece should be approximately the same distance from the observer's eyes. Use plan-corrected objectives that produce flat fields of view since significant field curvature requires continuous refocusing to examine the entire field.
- Neck – Bend the neck and head as little as possible, preferably no more than 10-15º.
- Back - Sit close to the work surface in an erect position while maintaining the natural curve of the lower back. Use a chair that provides good back support. Use additional lumbar support if necessary.
- Arms/wrists - Keep the upper arms perpendicular to the floor with the elbows close to the body. The forearms should rest parallel to the floor on a padded work surface while the wrists are kept straight.
- Legs – The area under the bench work area should be clear so that legs and feet are not impeded while sitting at the bench. Rest the feet firmly on the floor or a footrest. The chair should apply even pressure to the back of the thighs.

Reduce eye fatigue by ensuring that the microscope images are as bright, sharp and crisp as possible. This can be achieved by performing the Koehler illumination procedure on the microscope (see "Koehler Illumination Made Easy" in September 2006 LabOratory). Correct alignment of the microscope lamp and optical pathway will optimize the image quality and cause less strain to the eyes. A laboratory environment that is free from excessive glare and reflections from overhead lighting will further reduce strain to the eyes.

Many newer microscopes designs incorporate ergonomic features, such as one-handed stage and focus control, tiltable observation tube for optimum eye-level positioning, low-profile stages, rigid instrument body standards, and strain-free posture for operators while examining specimens. These features allow a more relaxed posture with the hand resting comfortably on the desktop. Although these ergonomically-friendly microscopes offer many features to reduce injuries and discomfort for the user, there are still many poorly equipped microscopes in many clinical laboratories. When an older microscope is replaced, ergonomic features should be considered in the new purchase.

Check out the following website and try the ergonomic tutorial that demonstrates the proper posture to use when operating a microscope:: *www.microscopyu.com/tutorials/java/ergonomics/posture/index.html*.

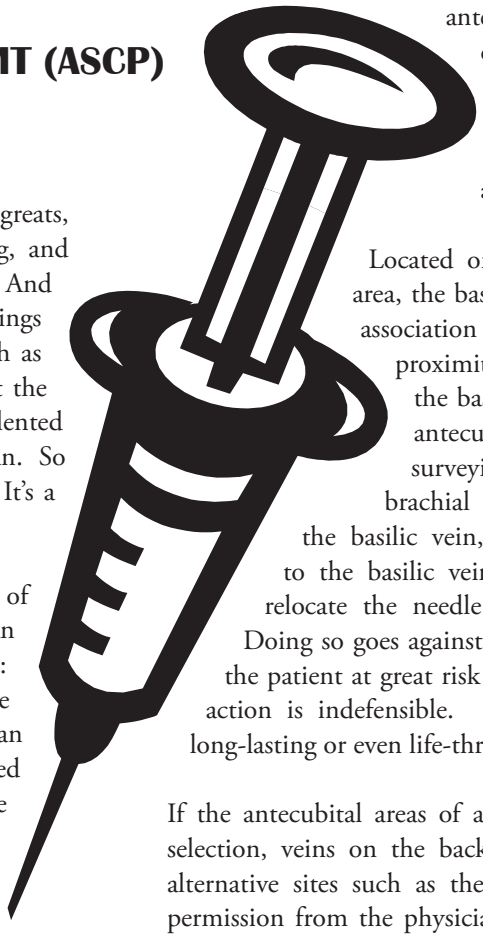
Submitted by
Colleen Miller, BS MT(ASCP)
Laboratory Improvement Consultant

EDITORIAL

Needle Points
By Lisa O. Ballance, BSMT (ASCP)

The Best of the Blues

When you think about the Blues greats, artists like Robert Johnson, B.B. King, and Muddy Waters may come to mind. And who isn't moved by the soulful stylings of Etta James, with legendary hits such as At Last? Or you may reminisce about the tragically short-lived but immensely talented Blues contemporary, Stevie Ray Vaughan. So who represents the best of the Blues? It's a lively debate we could engage in all day.



However, when it comes to the "best of the blues" in vein selection, the human anatomy typically offers one clear choice: the medial veins. That's because the median, median cubital, and median cephalic veins found centrally located in the antecubital area of the arm are usually easy to find. Close to the skin's surface, the medial veins, as these veins are collectively known, are often visually distinct and palable. The medial veins also tend to be more stationary than other veins, making a successful venipuncture more likely. Want to deliver a puncture with minimal pain to your patient? Sure you do. Want to minimize the patient's risk of a phlebotomy-related injury? Most definitely. Then, in most situations, selecting a prominent medial vein is your best bet, since there are fewer nerves in the same proximity as the medial veins. If your needle happens to miss a median vein, the bevel is less likely to strike and damage such delicate structures.

However, there are exceptions to every rule, and often these exceptions show up as outpatients in your draw stations. Therefore, if you cannot locate a medial vein after a thorough survey of both arms, consider the cephalic vein as a good second choice. Located on the lateral (outside) aspect of the antecubital area, a clearly visible and/or palpable cephalic vein is a better choice than a medial vein that you cannot access with a high degree of confidence. If neither the medial nor cephalic veins are discernable by sight or touch in either arm, then the final alternative is the basilic vein.

Located on the medial (inner) aspect of the antecubital area, the basilic vein is held as the vein of last resort due its association with a higher risk of injury. Because of the proximity of the brachial artery and median nerve to the basilic vein, all other more prominent veins in the antecubital area should be ruled out first. When surveying the medial area, locate the pulse of the brachial artery. If the pulse feels dangerously close to the basilic vein, select another site. However, if a puncture to the basilic vein is attempted and proves unsuccessful, never relocate the needle in order to recover the failed venipuncture. Doing so goes against the standard of care for phlebotomy and places the patient at great risk for an arterial nick and/or nerve damage. Such action is indefensible. Such resulting injuries are potentially serious, long-lasting or even life-threatening.

If the antecubital areas of a patient do not provide viable choices in vein selection, veins on the back of the hands are also acceptable. However, alternative sites such as the feet and ankles should not be used without permission from the physician, because of the potential for serious medical complications, such as phlebitis, thrombosis and gangrene. Unorthodox sites should never be considered. Also prohibited is blindly sticking when no vein is visible or palpable.

Those assigned blood specimen collection duties should be familiar with the general anatomy of the areas from which they draw blood, being mindful of the underlying structures likely present. In addition, any physical limitations and/or collection restrictions unique to the patient must be identified and observed.

Acknowledging phlebotomy as an invasive procedure that carries with it inherent risks is the first important step toward patient safety. Exercising an order of preference in vein selection also goes a long way in reducing those risks and assuring successful collections with minimal patient discomfort. Taking the time to do so just might keep your patients from singing the blues when they have to come see you.

E. coli Outbreak

Was it wild pigs running rampant through spinach fields? Water runoff from a nearby cattle ranch?

Chances are the answer will never be found to exactly how spinach became contaminated with *E. coli* that sickened nearly 200 people from 26 states since late August. Ever since the beginning of the outbreak, farms in the San Benito and Monterey counties of California have been suspected based upon a trace-back of bagged spinach and spinach-containing products processed by Natural Selection Foods. Investigators have taken roughly 750 samples from four ranches in the vicinity of the suspected spinach fields, but only one farm tested positive for the same strain of *E. coli* involved in the outbreak.

Thankfully, the outbreak appears to be over without a single case detected in North Carolina. A few suspected cases were investigated by the North Carolina State Laboratory of Public Health. Although *E. coli* O157:H7 was detected using conventional and molecular techniques (i.e., PCR), Pulsed Field Gel Electrophoresis (PFGE) indicated that the strains from North Carolina did not match those found in the nation-wide outbreak. PFGE is a very powerful technique used to separate complex mixtures of DNA for the purpose of size comparison. Identical strains will produce the same banding pattern or "fingerprint," allowing for matching between two infected individuals or with the suspected contaminated item.

Sources:
http://www.cdc.gov/foodborne/ecolispinach/
www.cnn.com

Article submitted by
Julie Ann Kase PhD, Public Health Scientist, Bioterrorism
and Emerging Pathogens Unit, NCSLPH.

Chlamydia Awareness Campaign Highlights Need for Outreach Testing

The 2006 Chlamydia Awareness Campaign was held in North Carolina from Sept. 18 through Nov. 3. The overall goal of this project was to increase awareness of chlamydia and other common sexually transmitted infections through education, screening, and treatment in non-traditional or outreach settings. Despite an expansion of screening test programs since the 1990s, chlamydia continues to be the most common bacterial sexually transmitted disease in the nation, predominantly affecting young adults between the ages of 15 and 24. Though easily treatable with antibiotics, when chlamydia and gonorrhea infections remain undetected and untreated, they can lead to serious complications such as ectopic pregnancy, chronic pelvic pain, and pelvic inflammatory disease (PID), a major cause of infertility. Since the majority of people with chlamydia and gonorrhea feel healthy and may have no symptoms, education and regular testing for sexually active men and women is vital to reducing the incidence of disease and subsequent adverse outcomes.

The Chlamydia Awareness Campaign is conducted annually by participants in the Infertility Prevention Project (IPP), a federally-funded grant program that is administered in Region IV through Emory University. This collaborative effort of public health care providers and state laboratories in eight southeastern states (North Carolina, Alabama, Florida, Georgia, Kentucky, Mississippi, South Carolina and Tennessee) provides data that can be used to assess the prevalence of chlamydia and gonorrhea infections in targeted populations. With this information, strategies can be designed and implemented to further reduce the incidence of sexually transmitted infections by utilizing more efficient systems for education, detection, and treatment.

North Carolina agencies participating in this year's event were the University of North Carolina – Pembroke; North Carolina Agricultural and Technical University; Metrolina AIDS Project of Charlotte; non-traditional test sites in Forsyth and Wake Counties; Robeson County Syphilis Elimination Project;

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Chlamyidia Awareness Campaign cont. from page 9

Western North Carolina Community Health Services; and Granville/Vance District Health Department. During the campaign, educational brochures were distributed and free urine testing for chlamydia and gonorrhea was offered to patients seen at the participating sites. Nucleic Acid amplification testing for chlamydia and gonorrhea was performed at the N.C. State Laboratory of Public Health using kits provided free of charge by GenProbe, inc. A total of 790 specimens were collected and tested. Of these, a total of 82 (10.5%) were positive for Chlamydia, and 19 (2.4%) were positive for gonorrhea. All patients with positive results were to be notified and receive treatment.

The success of the 2006 Chlamydia Awareness Campaign underscores a continuing need to reach populations at risk of disease that might ordinarily be missed through traditional screening efforts. The overall positivity rate for both chlamydia and gonorrhea observed in these patients was higher than those seen in our normal testing population (7% and 2% respectively). Enhanced outreach testing could be a valuable tool in reducing the incidence and transmission of these diseases.

Article submitted by
Mary Noel Dodd,
Bacterial STD Laboratory Supervisor

Laboratory Safety and Security 2006

A great learning opportunity, *Laboratory Safety and Security 2006* was held on Nov. 17 in Raleigh. The Laboratory Improvement section of the North Carolina State Laboratory of Public Health (NCSLPH) partnered with National Laboratory Training Network (NLTN) to deliver this educational conference. The conference boasted talented speakers, most of whom had more than 30 years of experience in the laboratory field. Over 100 people attended, some coming from as far away as Texas, Massachusetts and Alabama. Vendors who generously provided funding for the conference included Hagemeyer North America, National Biosafety and Biocontainment Training Program (NBBT), and Specialty Operations Solutions.

The event was held at the Wake County Shrine Club, which provided a comfortable and inviting environment. NCSLPH Director Leslie Wolf, PhD, opened the conference with a warm welcome to the speakers, participants and vendors. She also expressed how important the topic of safety is in the lab.

Vendors interact with the participants at the Laboratory Safety and Security 2006 conference.

The first speaker was Richard Green, MSc, CTM. Richard is the Safety Training Coordinator and Biosafety Officer for the Georgia Public Health Laboratory. His extensive knowledge came from working at the Centers for Disease Control and Prevention (CDC) for over 30 years. His presentation was very effective, as he interjected humor with the seriousness of the topic. One participant commented, "Humor (like a spoonful of sugar) helps the safety go down!" He spoke of different laboratory hazards that tend to get overlooked. Through demonstrations, pictures and interaction with the audience, he was able to convince the participants that safety is extremely important in the laboratory. Many participants commented that his presentation had opened their eyes and they were going back to reevaluate their own safety program.

The next speaker, M. Kristy Osterhout, BS, SLS(ASCP) is one of North Carolina's very own. The Lab Improvement Coordinator at the NCSLPH, she spoke

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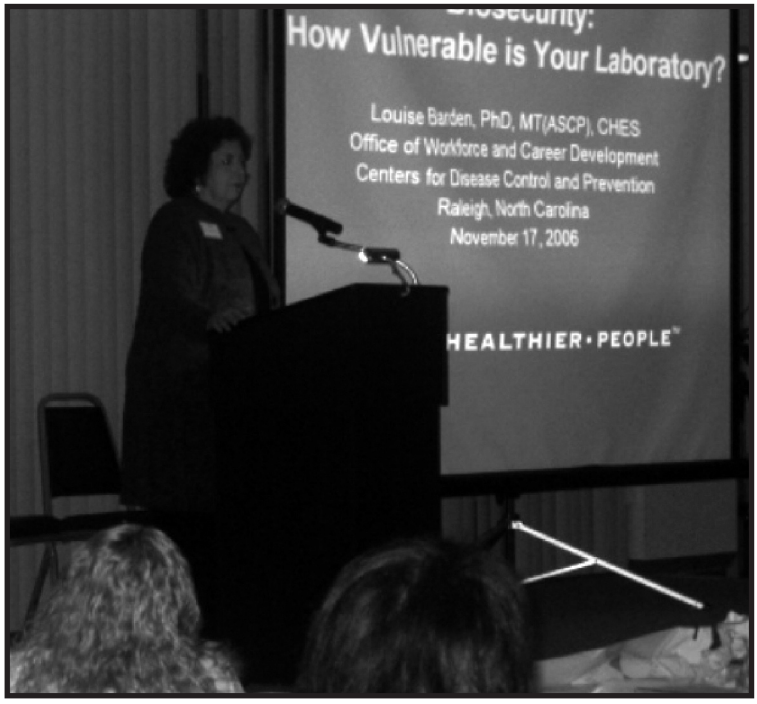
Laboratory Safety and Security 2006 cont. from page 10

on *What's New in Packaging and Shipping Laboratory Specimens*. Kristy successfully engaged participants and delivered very valuable information. This workshop came just in time, as the US Postal Service had just changed their regulations. She also spoke about changes with the U.S. Department of Transportation (DOT), International Air Transport Association (IATA), and North Carolina's courier service. Many participants were especially thankful for this information since it satisfied their recertification requirements.

After a fabulous lunch provided by the Wake County Shrine Club, the vendors were given a chance to speak briefly to the audience and give out door prizes. All of the vendors said the conference was a great opportunity to meet and interact with possible clients. In addition to the brief presentations, they were allowed one-on-one interaction with the participants during breaks and lunch.

The third speaker, Marsha Ray, M.S., is the Coordinating Officer for Terrorism Preparedness and Emergency Response for the CDC's Division of Select Agents and Toxins. She presented information on the Select Agent Rule. Many participants said they were not familiar with the Rule prior to attending the conference, but left with a better understanding of this important topic. She provided the participants with a background on the Select Agent Rule and discussed the forms and documentation involved.



Dr. Louise Bardon speaks to the participants about the importance of a Biosecurity Plan.

Dr. Louise Bardon concluded the conference with her presentation, *Biosecurity: How Vulnerable is Your Laboratory?* With over 15 years at the CDC, Dr. Bardon provided more expert knowledge. A Health Scientist at the CDC's Office of Workforce and Career Development, she covered the Biosecurity Plan from why it should be developed, to how it should be developed and when it should be reevaluated. Participants appreciated her approach to the subject. She kept the audience's interest through humor and interaction. That is a hard feat to accomplish on a Friday afternoon!

The Lab Improvement staff was thrilled to provide such an educational opportunity to North Carolinians and beyond. The overall experience of the speakers was astounding and it showed through their excellent presentations. Many participants appreciated the content on safety as it is of utmost importance in their jobs. The partnership between NLTN and NCSLPH proved successful and provided a well-received conference.

Kristy O'Briant, BS
Laboratory Improvement Consultant
North Carolina State Laboratory
of Public Health

Lab Test of the Quarter

Hemoglobin A1c

Also Known As

HbA1c, Glycohemoglobin, Glycated hemoglobin, Glycosylated hemoglobin

Sample Type

Blood (venous or capillary)

Related Tests

Glucose test, Microalbumin, Microalbumin/creatinine ratio, Fructosamine

Results

From *http://web.missouri.edu/~diabetes/ngsp/ghbmbg/ghbmbg.htm*

	Approximate Mean Plasma Glucose*		
HbA1c	**mg/dL**	**mmol/l**	**Interpretation**
4	65	3.5	Non-Diabetic Range
5	100	5.5	
6	135	7.5	
7	170	9.5	ADA Target#
8	205	11.5	Above Target
9	240	13.5	
10	275	15.5	
11	310	17.5	
12	345	19.5	

Mean blood glucose results are 10-15% lower. Most blood glucose meters are calibrated to read as plasma glucose.
#Diabetes Care 2004;27 (Suppl. 1):S91 - S93

Why test Hemoglobin A1c (HbA1c)?

HbA1c is used to evaluate long-term glucose control in diabetic patients. It is formed after the irreversible glycation of the N-terminal amino acid (valine) of the HbA ß chain when there is excess glucose in the body. In other words, it measures the amount of hemoglobin that has glucose bound to it. Since red blood cells have a life span of 120 days, HbA1c measures glucose control (how much glucose the cell has been exposed to) during that time period (~ 2-3 months). The American Diabetes Association recommends a target HbA1c level of <7%. It is a good idea to perform this test at least twice per year in patients who have stable glucose levels and who are meeting treatment goals. Patients whose therapy has changed or who are not meeting glycemic goals should have their HbA1c tested four times per year.

Interfering Factors: Situations that may interfere with the measurement of HbA1c include the following:

- Processes that decrease the lifespan of red blood cells
- Presence of other types of hemoglobin such as HgbS or HgbC
- Iron deficiency anemia
- Red blood cell transfusions
- Uremia
- Alcoholism
- Lead poisoning
- Hyperbilirubinemia
- Hypertriglyceridemia
- Lipemia
- Pyuria
- Hematuria
- Marked hyperglycemia
- Marked hypertension
- Drugs/vitamins

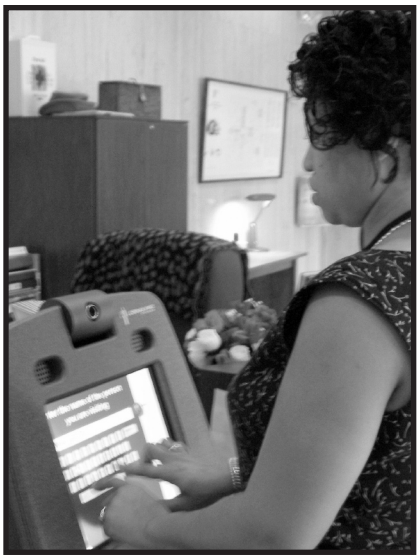
Resources:
Kiechle, FL. "Taking Diabetes Testing to the Patient." Advance for Administrators of the Laboratory. July 1, 1999.
Robertson, B. "How Sweet It Is: The Role of the Laboratory in Glucose Monitoring." NC 2nd Annual Clinical Laboratory Day. August 4, 2006.

Submitted by:
Jennifer Anderson
Laboratory Improvement Consultant

"LobbyGuard" Enhances Security at the State Lab

Visitors to the State Laboratory of Public Health will notice a recent addition to the lobby in the Bath Building. LobbyGuard, a visitor management and tracking software system, has been installed to enhance building security. The system, which replaces the paper sign-in log, is housed in a small self-service kiosk at the front desk. Visitors are not to be intimidated by the cold, gray exterior of the high-tech security system. The user friendly LobbyGuard will instruct the visitor through the sign-in process with visual and audio cues.

The system incorporates a computer, touch-screen monitor, barcode scanner, driver's license scanner, camera, printer, and software. A photo ID, such as a driver license or state employee badge, is required when registering to enter the building. At the kiosk, the visitor will initiate the registration process by touching the **Press Here to Begin** button on the monitor. The user will then choose one of the following selections on the screen: **Visitor** or **Courier**. At the next screen, the system camera photographs the visitor when he or she activates the **Take Photo** button. The system will then instruct the visitor to place his/her driver license into the scanner at the base of the kiosk. After the license is scanned, the system will ask the user to verify the name that is derived from the license scan. If the name is inaccurate, the user will enter the correct information manually. When a state employee badge is scanned instead of a driver's license, the user will be asked to type in his/her name. A courier will also be asked to type the company name he/she represents. The user is then instructed to select the purpose of the visit. Couriers have two options; they are **delivery of samples** or **picking up samples**. Visitors must select one of the following options: **training class**, **meeting** or **maintenance tech**. The visitor then types the name of the person he/she is visiting. This completes the sign-in process, and the system will print a visitor badge that contains the visitor's photograph, name, reason for visit, date and time of visit, and a barcode. When leaving the building, the visitor will sign-out of LobbyGuard by scanning the barcode badge.



The LobbyGuard program integrates with existing building security systems to further ensure your safety when visiting the State Laboratory of Public Health. We hope your visits to the Bath Building are a pleasant and safe experience.

Submitted by Colleen Miller, BS MT(ASCP)
Laboratory Improvement Consultant

Newborn Screening Education Promoted

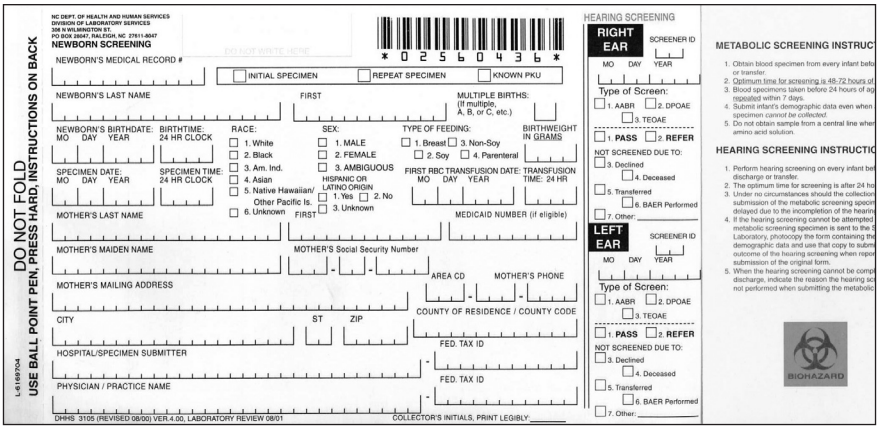
Earlier this year, a training course was developed to provide instructions and demonstrations on the proper completion of the newborn screening filter paper form. Laboratory Improvement, the training unit in the N.C. State Laboratory of Public Health, worked closely with the supervisors in the Newborn Screening/Clinical Chemistry Unit to produce an educational tool for employees of health care facilities that screen newborns for genetic and metabolic disorders. The on-line training was recently updated to include a quiz for participants who wish to receive continuing education credits.

When orders are filled for filter paper forms, the mailroom at the State Lab recently began inserting the following announcement with the ordered forms:

North Carolina Public Health

Attention:
Please forward to laboratory or nursing staff responsible for completing this form.

Training and Continuing Education Credit Opportunity



An interactive training course for instructions in completing the newborn screening, filter paper form (#DHHS 3105) is available on-line at http://slph.state.nc.us/. Demonstrations and animations instruct the user in the collection of the infant's blood, application of the specimen to the form, completion of demographic information, and shipping requirements.

After accessing the website, left click on the heading Newborn Screening, Form Training. The training module opens to a series of slides that can be advanced forward or backward at the user's pace. The estimated time for completing the study is 30 minutes to one hour. The final slide provides the user an opportunity to take a quiz and receive continuing education credits (0.1 CEU certificate).

Take time to learn the correct procedures for completing this form. It could save a child's life.
Call 919/733-3937 if you have questions.

This training was designed to reduce the number of rejected newborn screening filter paper forms received at the State Laboratory. Rejected forms delay testing infants with potentially life-threatening disorders. The use of this educational resource should greatly enhance the user's ability to submit accurate and complete demographic information and properly collected newborn samples.

Submitted by
Colleen Miller, BS MT(ASCP)
Laboratory Improvement Consultant

The Safety Corner

Exposure Control Plan Series - Control Measures

OSHA's Bloodborne Pathogens Regulation states the employer shall take appropriate preventative measures against occupational exposure. These precautions can be separated into engineering and work practice controls. The addition of personal protective equipment completes the safety control program.

Engineering controls are those that are "built into" the facility. These controls permanently remove the hazard or help isolate the worker from exposure. Examples include:

- Biological safety cabinets
- Puncture-resistant sharps containers
- Mechanical pipette devices
- Hand-washing facilities

Work practice controls alter the manner in which a task is performed. These controls reduce the likelihood of exposure by following universal precautions and a few other simple rules. These may include hand-washing policies, proper waste disposal techniques, and sharps handling procedures.

Once all other controls are in place, employers shall provide personal protective equipment (PPE) to employees to eliminate or minimize the risk of infection. PPE is the best defense against unexpected hazards; however, the equipment must be clean, in good repair, and used properly. For example, a lab coat does not protect against any hazard when it is unbuttoned. Be sure the lab coat is buttoned up when dealing with blood and other potentially infectious materials. PPE must prevent infectious materials from passing through to the employees' outer clothing, skin, eyes, or mouth. Some examples of PPE are:

- Gloves
- Masks, eye protection, and face shields
- Gowns, aprons, and other protective clothing
- CPR mouthpieces

All controls measures are important in the laboratory. They can save lives when used properly and in the right conditions. Look for the next installment of the Exposure Control Plan series in the next Lab-Oratory, when vaccinations and post-exposure evaluation/follow-up will be discussed!

Article submitted by
Kristy O'Briant, BS, Laboratory Improvement Consultant, NCSLPH

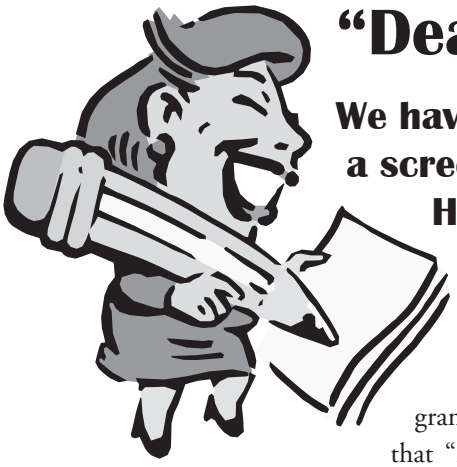
SAVE THE DATE!

WNCPHA Annual Meeting

May 3-4, 2007 • Hickory, NC

Continuing Education • Updates • Networking

Hope to see you there!!!



"Dear Lab-bey"

We have a fairly new physician in our area who is ordering a screening gram stain on urines. This is new to us. How prevalent is this and is there a specific protocol/ procedure for a urine gram stain? Are there any correlation studies to show its efficacy?

There are mixed opinions about the efficacy of performing routine gram stains on urine specimens. *Bailey and Scott's Diagnostic Microbiology* states that "it is the easiest, least expensive, and probably the most sensitive and reliable screening method for identifying urine specimens that contain greater than 105 CFU/ml" (colony forming units per milliliter.) It is noted, however, that a large number of tested specimens would yield only a few positive results.[1] In a study published by the European Society of Clinical Microbiology and Infectious Disease, the opposite conclusion was made: "Of the 200 urine cultures, 128 were negative, 37 were contaminated, and 35 were positive. Presence of bacteria on Gram-stain predicted 30 of 35 (85.7%) positive cultures. It was also found on 56 of 128 (43.7%) negative cultures. The predictive value of a positive test of Gram-stain microscopy of uncentrifuged urine was found 34.88%, the predictive value of a negative test was 93.5%, and the efficiency was 62.6%. These results suggest that positive cultures cannot be accurately predicted by only Gram-stain microscopy of uncentrifuged urine and that culturing should be performed."[2] It should also be noted that this is a CLIA high complexity test, so if a lab is moderate complexity or lower, they would not be allowed to perform this test.

If it is decided that the urine gram stain would be a useful tool in your facility, Bailey and Scott recommend the following procedure when performing a urine gram stain:

1. Place one drop of well mixed urine on a labeled glass microscope slide.
2. Allow to air dry and fix the specimen.
3. Gram stain.
4. Examine under oil immersion (1000x)

After examining at least 20 fields, the presence of at least one organism per field corresponds with significant levels of bacteria (>105 CFU/ml.)

1. Forbes BA, Sahm DF, Weissfeld AS. *Bailey and Scott's Diagnostic Microbiology*. 11th ed. St. Louis: Mosby; 2002.
2. Yazici KA. "The Efficacy of Urine Gram Stain Microscopy in Predicting Urine Culture Results." *European Congress of Clinical Microbiology and Infectious Diseases*. 14th European Congress of Clinical Microbiology and Infectious Diseases, Abstract No. 903_ r2188. Available at: http://www.blackwellpublishing.com/eccmid14/abstract.asp?id=15830. Accessed November 6, 2006.

Special thanks to Cathy Barrett of Cape Fear Valley Medical Center in Fayetteville, N.C., for her assistance on this question.

"Dear Lab-bey..."

If you have a technical laboratory question that you would like to have answered please submit it to: Jennifer.A.Anderson@ncmail.net.

The answer to your question may be featured in the next edition of Lab-Oratory.

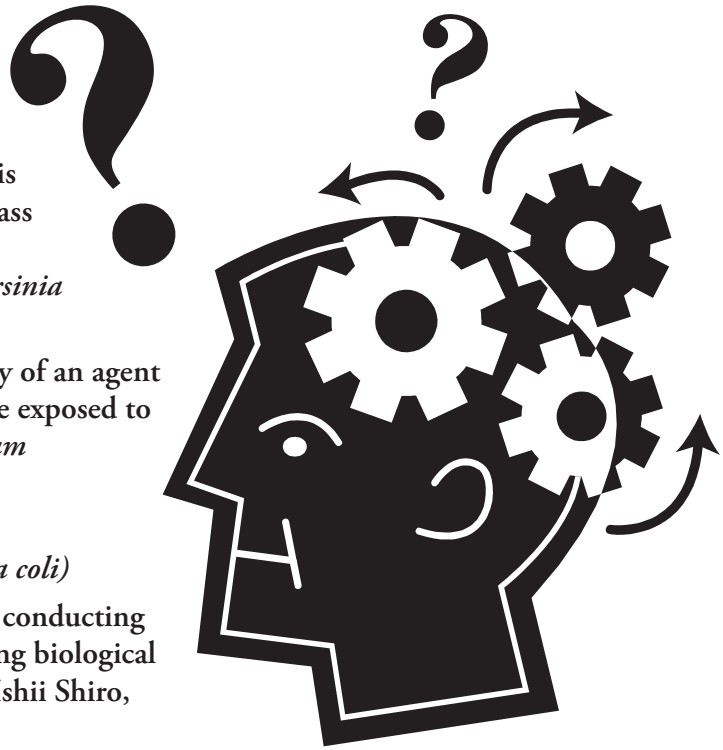
Bioterrorism

C C Y E R F R F W L O O T L F D B P M Z P E D A H
Y P D J J M I I B H V R N R I R B S M M I R L J K
Y A L R R S C W N C I H E R U P X B I O P L E X C
P Y S A T I I C J R M T M C L Y L A F Q E I L A H
M G C S G L N S J B M K E F I Q N O L S N R E F B
Y E D P A U A H Y H Y L C P T C G Z I Z P H J Q P
I W E T T T E V N N L I R P O D B C S T A Q R B Q
G B M E U O A C H A J M O M Y W N A L L E I X O C
Y C F R U B Z E K H T P F K C A D G R P O E H Z L
B E I R F H X P R P G L N I R X A E W Z M M B B P
O B B O S Y A O Z H H G E F W V O V R V P G X F Q
L G S R P P X X K U T X W N O Y S P M X S P R N X
N V C I R N S D Q W A E A C C X X U L Y U T H U O
E Q M S T G T I V R L D L Z F F I D Z L P L I H L
A R H M N R B X H N O F Q P C P U X J R A C M K O
T C H E Q M B T G J O H F O I X R D V J W M D O E
P X M Y E R N V H C C J C A S T O R B E A N S N W
R J N D J A U X G K V Q S H S Q L D F S R J P I R
Z Y X F U W L Y T M K Z E X E C E U N L W H I B C
L P B T V W Q O E L C T C L U T H S M U L B A J P
N O I T A G I T S E V N I L A N I M I R C G Q E L
H D C N M I H Y R Q C R Z K W G Y Y J P T J W E Y
W H O G F T S L S D G A X E I K D P D B W M P M M
E C M J C S T F X S V H C Y Y O O Z Q J S C C Z L
S B V U B Z O P A E U J I Q Q P W Q X C L Y F U O

ANTHRAX
BIO PLEX
BOTULISM
BRUCELLA
CASTOR BEANS
COXIELLA
CRIMINAL INVESTIGATION
FBI
FERN
FRANCISELLA
LAW ENFORCEMENT
MULTIPLE THREAT ASSAY
PAPR
PLAGUE
RICIN
SBI
SMALLPOX
TERRORISM
TRF
WHITE POWDER

Created by Puzzlemaker at DiscoverySchool.com

Brain Exercise



Test your laboratory knowledge. Select the best answer(s).

1. Although the United States could not produce this agent for weaponry because it lost virulence in mass production, the USSR successfully overcame this problem and produced it in large quantities. *(Yersinia pestis, Coxiella burnettii, Francisella tularensis)*
2. In 2001, 5 people died from the inhalation variety of an agent known as "Wool Sorter's Disease" when they were exposed to this organism in mailings. What is it? *(Clostridium botulinum,, Bacillus anthracis, Yersinia pestis)*
3. What is the causative agent of "Rabbit Fever"? *(Francisella tularensis, Vibrio cholerae, Escherichia coli)*
4. Name the scientist that led Japan's "Unit 731" in conducting experiments for germ warfare during WW II, using biological agents such as anthrax and plague. (Lt. General Ishii Shiro, Admiral Kantaro Suzuki, General Hideki Tojo)
5. What state leads the country in naturally acquired cases of plague? (California, New Mexico, Texas)
6. Name the two countries that hold the last "known" samples of the smallpox virus, Variola. (United States and Russia, United States and China, United States and Germany)
7. What genus includes the species: abortus, melitensis, suis, canis. *(Brucella, Yersinia, Burkholderia)*
8. Experiments in the United States to determine the exact number of organisms required to cause infection were first done using the organism that causes Q fever. What is the organism? *(Coxiella burnettii, Yersinia pestis, Francisella tularensis)*
9. Mass die-offs of this common animal are usually associated with outbreaks of *Yersinia pestis*. (raccoons, rats, frogs)
10. In WW II it is believed that Russians retreating from the German Army tainted drinking water supplies with what organism as part of their "scorched earth" policy? *(Bacillus anthracis, Francisella tularensis, Bordetella pertussis)*
11. During WW I, the German Army used what organism to target the horses of the French Cavalry? *(Burkholderia mallei, Yersinia pestis, Clostridium botulinum)*
12. Only 500 ug of this toxin is considered a lethal dose when injected. In 1978, the KGB assassinated a Russian national in London with a dose fired from a modified umbrella. What is it? *(Ricin toxin, Botulinum toxin, Shigella neurotoxin)*

Questions submitted by:
Colleen Miller, BS MT(ASCP)
Laboratory Improvement Consultant

Lab-Oratory Quiz

The answers to this quiz may be submitted for two (2) contact hours of continuing education credit. You must receive at least an 80% to receive credit. Please return test to Crystal Poppler at the following address: North Carolina State Lab of Public Health • Lab Improvement Office
306 N. Wilmington St • Raleigh, NC 27601

This quiz covers all Lab-Oratory newsletters for 2006. Please note that the Lab-Oratory may also be found online at *http://slph.state.nc.us/* under Laboratory Improvement.

1. Where are the three Regional Response Labs located? _____

_____

2. What were the criteria used to select the health departments chosen to participate in the CytycThinPrep® Imaging System validation Study? _____

_____

_____

How many counties were chosen? _____

3. Which Arboviruses does the North Carolina State Lab of Public Health test for? _____

_____

4. What type of eyepieces allows the user to wear glasses when viewing specimens under the microscope?

_____

_____

5. What is the benefit of an iris diaphragm over a disk diaphragm? _____

_____

6. What are the two most recently revised CLSI documents regarding blood collection standards?_____

_____

_____

7. What types of disorders are detected by the tandem mass spectrometry (MS/MS) unit at the NCSLPH?

_____

8. What is the treatment for an infant diagnosed with Galactosemia (GAL)? _____

_____

_____

9. Name the five different Hemoglobinopathies that can be detected in a newborn screening specimen.

_____

_____

_____

10. What type of mosquitoes transmits LaCrosse Encephalitis (LAC)? _____

_____

11. What are the critical values (in the Lab-Oratory) for blood glucose? _____

_____

_____

12. (True or False) You should clean the interior of the eyepieces, objectives, and the bottom of the condenser whenever you clean your microscope. _____

13. Name the identifiers that NCSLPH requires to be present on a patient sample submitted for testing.

_____

_____

14. What is the first and most critical step in blood specimen collection? _____

_____

_____

_____

15. Name three things a supervisor and employee must classify in order to prepare an exposure determination. _____

_____

16. (True or False) Clinicians are permitted to use xylocaine or KY jelly in order to reduce patients' discomfort when collecting urethral specimens for GC. _____

17. Who is the new state Deputy Health Director? _____

18. What percentage of adult hemoglobin is comprised of Hgb A2? _____

19. In what percentage of African Americans does Hgb B2 occur? _____

20. What are the methodologies determined by the College of American Pathologists to be more likely to detect Hgb A2' (A2 prime)? _____

_____

21. How many North Carolinians die each year as a result of diabetes? _____

22. What members of the coliform group have been recognized as potential indicators of the presence of bacterial pathogens in a drinking water supply? _____

_____

_____

23. What is the name of the rule mandating that water treatment plants test surface water? _____

_____

24. Name five situations in which a skin puncture should be considered for collecting a blood sample.

_____

_____

_____

_____

25. What procedure should be performed on newborns and infants under 12 months of age? _____

_____

26. What percentage of total cholesterol is considered "good"? _____

27. What number should you call before submitting specimens suspected of being select agents? _____

_____

What form should be submitted with these specimens? _____

28. What topics should be included in annual safety training? OSHA's Bloodborne Pathogen Standard?

_____

_____

_____

_____

29. Name five of the twelve essential health services delivered at the state level._____

_____

_____

_____

_____

30. What is the chance of an infant having Biotinidase Deficiency when both parents are carriers? _____

_____

31. Since the advent of screening in 2004, how many infants have been diagnosed with Biotinidase Deficiency in North Carolina? _____

32. What serious complication is associated with Taenia solium? _____

_____

33. What is the maximum angle of the neck when viewing specimens under the microscope? _____

34. Which vein should only be used as a last resort when performing phlebotomy on a patient? _____

_____

35. Name five of the 14 essential features of any Incident Command System._____

_____

_____

_____

_____

_____

36. What is another name for Hemoglobin A1c? _____

37. What is Hemoglobin A1c used to evaluate? _____

_____

38. Name a form of ID required for registering using the LobbyGuard at NCSLPLH. _____

_____

39. Name three examples of engineering controls: _____

_____

_____

40. What is the procedure for performing a urine gram stain?_____

_____

_____

_____

Extra credit (five points each):

41. How many "fields of interest" are located by the Cytyc ThinPrep® Imaging System? _____

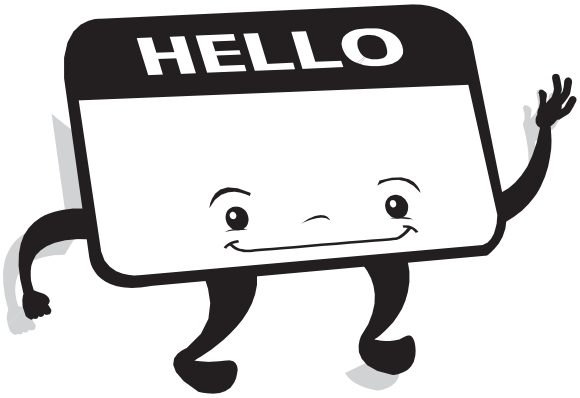
_____

_____

_____

42. Of the 8,247 specimens tested for rabies in the last two years, how many tested positive? _____

43. How many patients tested positive for LaCrosse Encephalitis in 2005? _____



Who's New in Public Health?

The following are this quarter's newcomers to North Carolina's Public Health arena. We would like to extend a warm welcome to you all. As always, we hope you will continue to stay with us and will find your job both enjoyable and fulfilling as you serve the citizens of North Carolina.

The North Carolina State Lab of Public Health would like to welcome the following new employees. We hope they will find their service with us rewarding.

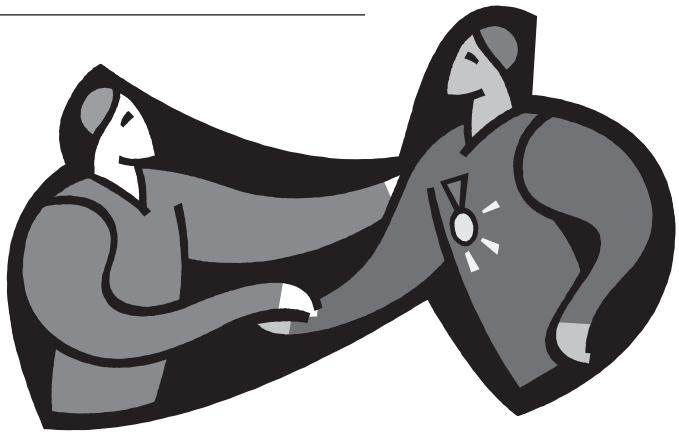
Virology/Serology welcomes Pamela Hooker, Med Lab Tech I, a work-against in Serology; Marilyn Caroway, Processing Assistant in Virology/Serology; Tracey Joesy, Processing Assistant in Virology/Serology; Kami Terry, Med Lab Tech I in Chlamydia/Gonorrhea; and Erik A. Davis, Med Lab Tech I. Eric was recently made permanent—Congratulations to Erik!

NBS/CC welcomes Jo Ann Black, who started work on September 28.

Syed Muaz Khalil has just joined the Bioterrorism and Emerging Pathogens unit as the medical technologist in the Pitt County Regional Response Lab. Welcome to Syed!

Finally, Rachel Gast and Mindi Russell are our new EID fellows. Please see the article in this issue about the EID fellow program here at the State Lab.

Kudos!



In the spring of 2005, the NCSLPH began naming a State Lab Employee of the Month. Employees are encouraged to nominate co-workers who demonstrate great work ethics and always lend a helping hand. In September, Earl Hazelton in Environmental Sciences was honored, and Colleen Miller of Lab Improvement was the October recipient of the award. Our November recipient was Mike Kaufman from our Administration Branch. Congratulations to all of our winners, and thank you for your contributions to the NCSLPH!

The NCSLPH Cytology Department passed ASCP proficiency testing for the second year in a row. Testing is proctored and participants have to receive a grade of 90% to pass. Testing was administered on September 12. Good job, Cytologists!

Beverly Morgan is retiring on Dec. 29 after 22 years of service. She works in Blood Grouping and Typing and also helps with Blood Lead testing. We'll miss you, Beverly!

Janice West and Crystal Poppler in NCSLPH Lab Improvement deserve a big round of applause! They attended an extensive two-week course and graduated N.C. Certified Training Specialists. Congratulations to both!

Jennifer Anderson in NCSLPH Lab Improvement also deserves a pat on the back! On October 12, she received NCPHA's Laboratorian of the Year award. Way to go, Jennifer!

Please contact Kristy O'Briant at (919) 733-7186 or kristy.obriant@ncmail.net if you would like to recognize a co-worker at your facility.

Laboratory Improvement
P.O. Box 28047
Raleigh, NC 27611

Lab-Oratory can also be found on the web at http://slph.state.nc.us/ under "Lab Improvement".

Brain Exercise Answers:

1. *Yersinia pestis*; 2. *Bacillus anthracis*; 3. *Francisella tularensis*; 4. Lt. General Ishii Shiro; 5. New Mexico; 6. United Status and Russia; 7. *Brucilla*; 8. *Coxiella burnettii*; 9. rats; 10. *Francisella tularensis*; 11. *Burkholderia mallei*; 12. *Ricin toxin*

State of North Carolina • Michael F. Easley, Governor
Department of Health and Human Services • Carmen Hooker Odom, Secretary
Division of Public Health • www.ncdhhs.gov
N.C. DHHS is an equal opportunity employer and provider.
12/06